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ABSTRACT

This paper presents "conjectures" about how rural students from isolated or economically declining communities may come to understand and negotiate their academic classroom experiences. In contrast to the metropolitan culture of America, such students continue to define successful living in ways that do not assume obtaining college degrees and leaving home. While educators like to consider high school as a place for preparing students for real life, students consider school to be real life. Many "low achievers" actively choose what and how much they will study, based on goals that may not include academic higher education. These goals may lead fully able students to choose vocational courses and programs over academic ones. Most contemporary high schools have a status system that values courses and programs leading to college, and the axis of vocational versus pre-college curricula becomes a primary vehicle for stratification. Mathematics teachers are likely key players. These "conjectures" make explicit the likelihood that students and teachers are "socially reconstructing" school or mathematics as they understand and negotiate it. Viewing lack of interest in math as a character flaw of students, rather than an active appraisal of its utility, leads to teacher elitism that can interfere with school success. Reducing or eliminating the stratification of school knowledge is crucial if we are to transform rural high schools into mass preparatory ones, assuming this is our proper goal. (Contains 39 references.) (SV)

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The Social Construction of Rural Mathematics: Conjectures, Contradictions and a few Hypotheses

Working Paper No. 7

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University of Kentucky
March 2003

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Paper presented at the
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Ravenwood Castle, McArthur, Ohio

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Alan J. DeYoung
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In an uncharacteristic opening move for me, I want to offer my conjectures – hypotheses – early in this paper, and then follow with some substantiation for their possibility. Thanks to the sponsors of this conference for allowing me the opportunity to think out loud here, and for supporting me in some data collection related to the "conjecture" testing I am just beginning in two Eastern Kentucky High Schools.

I am going to keep calling these conjectures for purposes of this paper because the sorts of experimental controls one would want to see in formal hypothesis testing are not part of this discussion, nor will they be aggressively pursued in my planned fieldwork.

Conjecture #1: Although the metropolitan culture of America is a dominating force, and a force that uses schools to partly teach its ideology, in some more isolated or economically depressed regions of the country, rural high school students continue to define successful living in ways that do not assume obtaining college degrees and leaving home.

Conjecture #2: Educators like to consider the high school as a place for preparing students for real life. The curriculum is where we put much of our effort. We make the mistake, though, of confusing our constructions of (curricular) life with the social and personal lives of students. As John Dewey argued, the schools are understood by students

not as preparation for (later) life, but as *real* life. Today. Most do not as easily understand it as only a preparatory location as teachers and professors do (Dewey, 1897).

Conjecture #3: Although many teachers and state education officials will explain lack of academic achievement in some rural schools as indicative of poor student attitudes or abilities, some, even many, so-called "low achievers" actively choose what they will study and how much they will study *because* their future goals may not include academic higher education (see Conjectures #1 & #2).

Conjecture #4: Many fully able high school students faced with academic choices in high school will actively choose vocational courses and programs over academic ones *because of* their future aspirations and plans.

Conjecture #5: There is a status system in most contemporary high schools that today values courses and programs leading to college. Consequently, teachers who are the advocates and gatekeepers for these programs are known and respected – even feared – by both other teachers and students. Math teachers are likely key players in these distinctions.

Conjecture #6: Since there is great talk about wanting to make rural high schools as "successful" as suburban ones these days, those who wish to create interest and desire among the larger student body will have to acknowledge that *not* choosing higher academic school offerings is rational for some students. Any high school that truly wants to induce all students to attempt and complete higher academic coursework will have to create ways of making such choices possible and desirable for students, and will have to reduce the status differentials between vocational, general and college track students and teachers.

Misunderstanding the American Educational Past

Most educators today would have us believe that American education is a context primarily for creating academic achievement and therefore for enabling upward social and economic mobility. Often they moan, however, that many high school students are "unmotivated" to achieve and waste enormous amounts of time in school and at home "not studying" (e.g., Steinberg, 1996; Ravitch, 1995). But these are fairly recent understandings of the role of schooling: they seem to assume as fact that young people are genetically created for twelve years of formal education, and have little else to do but to study. It thus blames the victim, as if adolescence and powerful peer groups were created by young people themselves, and young men and women are happy undergoing extended periods of dependency, awaiting a distant permission to enter a socially constructed adulthood.

In point of fact, high academic achievement was rarely the norm in American education or our rural schools for most of our history. So too is any understanding that the purpose of schools has been and remains to liberate the individual from the local community in search of upward mobility. American rural schools are actually not unique in these matters, but certainly the idea that their primary function was or is academic is inaccurate. In short, the way in which rural young people have usually understood the schools' academic promise remains *problematic*, at least in the view of many contemporary educators.

One aim of this working paper is to explore a few of the non-academic functions of rural schools in America, and to articulate a view that gives many young people "agency" in their efforts to negotiate early adulthood. This "constructed" early adulthood

has historically only partly involved school academic achievement, and this likely remains true today in particular types of rural high schools. I conclude with further consideration of the just-presented working hypotheses on how many rural students from isolated or economically declining communities may come to understand and negotiate their academic classroom experiences. These negotiations may help today's rural educators understand how to more effectively fashion school experiences for young people.

More History

More extensive discussions of the historical changes in American attitude toward educational purpose can be found elsewhere (e.g., DeYoung, 1995; DeYoung and Lawrence, 1995; Perkinson, 1995). I do need, however, to very briefly sketch some historical interpretations relating schools to their communities. I will then relate those interpretations to how students understood, and some still may understand, the school and the meaning of school. My argument is that both the definition of "school" in the US, and expectations of how students should view and use the school, have changed greatly during this century. Later in this essay I argue that understanding schools and high schools should not only focus upon the *content* of the school curriculum. It also must consider the social stratification of knowledge in America and the politics of the curriculum

The basic argument goes like this: rural schools during the nineteenth and early twentieth centuries were typically the primary social and community site to be found on the frontier or back in the country. They did have modest instructional responsibilities, but they were supported and loved as much for their symbolic and moral meanings to the

community as they were for high curricular standards. Residents of many communities could proudly talk about "our school" and its band and football team. They could talk about the fine Christian qualities of teachers and school administrators and how their influences would only be positive for the moral character of children and young people. Fewer, though, could likely explain the math or science curriculum or even the courses available in the building.

American schools from their early beginnings were designed first for character training and for very basic instructional skills: reading, addition, subtraction, and so on (Cremin, 1961; Perkinson, 1995). A primary school function was to "Americanize" children by teaching national history and culture. Only a very few students were expected or could use the rural school – or the inner city one – to go the university. Once formal linkages from the town or rural school to the outside world emerged during the mid-twentieth century, the linkage was primarily to work through vocational and commercial education programs, not college preparation and advanced academic instruction.

Until recently, therefore, young people in their late teens were only rarely considered "students" in most rural American communities. The student role was mostly reserved for those who wanted or could be supported to go to college. In our part of the world, Appalachia, eight years of education was pretty typical; more – especially for boys – was sometimes looked down on as just plain useless. Young men and women in their late teens were often more interested in work and love and life, not in book-learning.

In metropolitan and then suburban America, rising expectations of more schooling, and the consequent prolonging of entry into adult statuses, outpaced these developments in many rural communities. During the twentieth century, America

rapidly moved from a rural nation to a metropolitan one, and urban schools began to drive national education reform (Tyack, 1974). What a school was all about, beyond the yearly plays and athletic contests, grew in importance as state and national academic pressures began to grow. Students were also exhorted to understand that better occupational opportunities demanded more and higher educational achievement. This was certainly true in some cities; and partly true in some villages. In places where employers turned to schools for workers, or where college presidents heavily recruited local high school students, greater academic achievement likely occurred.

Rural schools (like some city neighborhood schools), still had local orientations and not only national ones, even into the current era. Schools were seen as part of the community, rather than as places to propel one out of the local community. They were seen primarily as sites for the perpetuation of local culture, not as sites for developing human capital for national (or now, global) development interests (Peshkin, 1971; Fuller, 1982). And both rural and city educators were involved in discussions and received professional development related to how their instructional efforts could and should be dedicated to local and community matters in addition to or instead of national ones (Perkinson, 1995).

Some Sociology

The growth and transformation of formal schooling was and is, of course, a primary focus of many sociologists. Their work invariably concerns itself with understanding or situating personal biographies where they meet history or social structure (Mills, 1956). At the level of community, the interest is in how local institutions like the school are created or refashioned as functions of changing

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demography and economy. One observation has been that the very understandings of childhood, youth and adulthood are themselves constructions emanating from changed demography and economy (Hollingshead, 1949). Changes in local economies and demography redefine debate and policy about what people should know and be able to do in the emerging society.

Tonnies wrote about "gemeinschaft" versus "gesellschaft;" Durkheim about "mechanical" versus "organic" solidarity; Inkeles about tradition versus "modernity;" etc. (Coser, 1971; Inkeles and Smith, 1974). For all of them and many others, the transition from rural, small, and intimate particularistic communities to something larger involves not only learning new and different skills, but also new and different ways of relating to others, and changing common understandings about legitimate and appropriate interaction patterns (norms). Their concern is often how individuals respond or are socialized or re-socialized to accommodate their worldviews, expectations, and behaviors to social change (Parsons, 1959; Dreeben, 1968). Important for purposes of this essay is the observation that schools and formal schooling have rarely been central for the masses in rural communities in Western history.

Just as what the school teaches is altered by social change, so too is the interpretation of youth and adulthood that educators come to work with. The classic sociological work on the social construction of adolescence was that of James Coleman (1961). Although many like to cite his concerns with the "adolescent subculture" as the reason students of today are distracted from academic achievement, they fail to remember that he and his colleagues argued for *less*, rather than more, classroom curricular time as one way to improve learning outcomes. As have generations of previous educators,

Coleman and others have often urged integrating young people back into their communities rather than increasing classroom instruction time as a way to better public education (Coleman et. al., 1974; Kilpatrick, 1918 ; Dewey, 1900).

In any event, American communities and notions of community in rural America have changed dramatically during the past 100 years. The industrial and information economies have had much to do with these re-definitions. And the "community" school has been forced to adapt and change as rural communities have changed, stagnated or been redefined by the larger social transformations. Educational movements and reforms designed to help students adjust and adapt to their local places gave way during this period to movements for increased academic concentrations and to aspirations and expectations for higher education. Henry Perkinson (and others) argue that localism regarding public education was increasingly abandoned as the norm by the 1960s and 1970s (Perkinson, 1995). The civil rights movement and aspirations for upward social mobility increasingly focused on educational opportunity – and opportunity viewed not as an opportunity to receive vocational education to stay close to home, but as opportunity to obtain higher academic training that would enable the successfully educated to pursue careers in communities other than those in which they were born.

For our purposes, this has meant that the role of "student" has had to be refined, a process still underway. Martin Trow argued that using schools to increase technical and professional skills has caused them to no longer be "mass terminal" institutions but "mass preparatory" institutions. By 1950, nationally, more students were using high schools as preparation for further education than were using them for vocational preparation to stay in their local towns and cities (1961).

But the national movement to redefine high schools as human capital breeding grounds for the national economy does not mean that all rural communities have easily accepted the dynamics of this transition. Many rural communities still resist the idea that their schools are primarily sites for teaching academic skills to students who will leave with them for elsewhere. There are still rural communities where the Saturday night ball game, the winning season, or a well-behaved student body are good indicators of a good school, even if SAT scores are not the highest in the state.

At the same time, some rural high school students still resist the idea that they are to gain academic skills to leave home and their local economy to pursue college and jobs elsewhere in the country (see Conjectures #1, #2 and #3). These motivations that run contrary to the "norm" – that is, contrary to what education departments and teachers now demand – are what this paper is mostly about. The truth is, I believe, many rural high school students would just as soon stay close to home and work for lower pay rather than go off to college and not return. They thus yet resist the current conventional wisdom Trow suggested a generation ago: that high schools need to be mass preparatory institutions. And this resistance is rational, not due some inability.

Social Class and The School

Although community is a dominant theme of this paper, so too is social stratification (see Conjectures #4 & #5). I would be greatly remiss to argue that rural community schools were or are bastions of benevolence in a storm of indifference. It is just as true in rural places as in metropolitan ones today that schools are enmeshed in the process of social stratification. Researchers examining the social stratification of the school and community consistently find that formal schooling systematically reproduces

the American social class structure (Oakes, 1985; Spring, 1976). Rural American high schools, too, are not always benign community sites with happy youngsters blissfully and equally participating in science labs and merrily manipulating their graphing calculators. Elites in the towns as in the cities have often used rural high schools as avenues to colleges and universities to partly solidify their community class positions.

In the nineteenth century, the few clerical or accounting jobs locally available could only be accessed via formal secondary schooling, which itself was only accessible to those living in towns rather than out in the country. The same pattern held true in the early twentieth century: the better jobs were as often as not accessible only through vocational or agricultural programs that most youngsters could not afford to attend because they were needed at home. By mid-century, the axis of vocational versus pre-college curricula had become a primary vehicle for stratification. In point of fact, one of the major sociological works on social stratification in high school was done in rural America by Hollingshead (1949) in *Elmtown's Youth*. One fascinating observation his team of researchers recorded at the Elmtown high school was a major contest for legitimacy between the academic and vocational teachers, a contest that is mostly lost by vocational educators these days (see Conjecture # 4). Note how the language here (from 1949) also approximates what we hear about students in our high schools today, as well as the reversal of fortune between the teaching groups:

> Because the academic teachers believe that college preparatory students have more ability, are more interested, and do better work than those in the general course, they prefer to teach the former group. Although these contentions may be true, more probably teachers of the college preparatory

group satisfy their desire to see the students reflect the academic values they hold. These teachers look upon students in the general course as persons who have nothing better to do with their time, are mediocre in ability, lack motivation and interest. Students in the commercial courses are believed to be lower in ability than those in the general course. ... (meanwhile), the vocational teachers differ from the academic teachers in their estimates of student ability, as they do in most things relative to the school. (T)hey believe that students specializing in their courses are as bright as the rest of the lot. These divergent beliefs between the two groups are in part a defense of their own interests and in part a result of the thinly veiled animosity that prevails between the academic and the vocational teachers. Each teacher in the vocational subjects – agriculture, home economics, shop, band, and secretarial science – has an especially equipped room. Teachers in the traditional subjects – English, algebra, geometry, Latin, French, chemistry, physics, and history – believe that too much money is spent out of the limited school budget to equip these rooms. ... Salary differences between the two groups is another potent source of friction, since the highest salaries are paid to the vocational and the lowest to the academic teachers. The cleavage between the academic and non-academic interests enter into every aspect of school life – curriculum, grades, student government, athletics, and the cliques in which one participates (pp. 171-172).

Since Hollingshead's day, the school curriculum, both metropolitan and rural, has increasingly become stratified between the general curriculum and the college track

curriculum. Those who master the college preparation curriculum will be more "successful" in terms of attending college and leaving the community; those who do not will like have lesser future educational and occupational opportunities. Unfortunately for those interested in equalizing school opportunities, the causes of the stratification of knowledge in the high school are often laid exactly at the feet of the "high status" subjects and their teachers. Mathematics is one such area (Oakes, 1985; deMarrais and Le Compte, 1995). Without further discussion here, my Conjecture #5 is focused on this matter.

Rural Communities And Rural Schools: Typologies

Americans are primarily metropolitan now, and most rural communities either lie within SMSAs or identify as much with them as with our rural past. By now, in most places, the household economy has given way to the industrial economy, and impersonal institutions have superseded more personal ones. Schools have been part of this transition, and have generally become less personal and more impersonal. They have moved away from community control (for good or bad) and increasingly became instruments of state and national industries and governments.

At the same time, there are quite likely some number of rural counties, communities, and schools that remain more "traditional," with more localist orientations and practices than others, depending upon distances from metro America, economic trends and demography. Unfortunately, *rural* as a meaningful definition has some problems (Bozak and Perlman, 1982). The US Census Bureau as recently as the 1990s had no "rural" category, terming locales as either metro or "non-metro." The bureau claimed there were 2,443 non-metro counties in America, and used eight categories to

describe them. Three of the bottom categories according to statistics were over-represented in Appalachia and the South: 242 "persistent poverty" counties, 200 counties dependent upon mining economies, and 512 where primary household incomes were based upon retirement income. But in some ways the above categories remain unhelpful at the level of community. "Non-metro" is not a very useable characteristic even for county data, and school communities are usually not congruous with counties in the US anyway.

The Appalachian Regional Commission (ARC) divides rural Appalachia into depressed and non-depressed communities; communities with lower population densities and located farther from regional growth centers generally display poorer economic indicators. Gjelten (1982) offers an alternative typology consisting of five rural community types: rural communities on the immediate fringe of urban areas; those located farther out, but still within commuting distance to metro work places and thus partly composed of city out-migrants who commute to work; stable (usually farm related) rural communities; those previously dominated by extractive industries (logging and mining) now in decline; and finally, isolated communities far removed from transportation corridors. By whatever system they are categorized, many of our Appalachian communities remain depressed, in persistent poverty, or isolated – or all three.

Appalachian "otherness," though, is not a theme of this work. Much of the writing on the region attributes its rural poverty to the medical and personal characteristics of people here, rather than to the uneven or exploitive nature of its extractive economy (Eller, 1982; Whisnant, 1980). When "Appalachia" gets used in a

construction of regional issues, often "Appalachians" are stereotyped as backward people deficient in motivation and intelligence; students in Appalachian schools are often painted with the same brush (Billings et. al., 2001).

An alternative interpretation is that rural Appalachians have dealt with – and continue to do so, admirably – an extractive economy that first created exploitive, low-paying and low-skill jobs, then eroded them through decades of mechanization. Many young people in the mountains were first forced to take difficult and low-skill jobs in mines and in timber and oil extraction, then found these jobs hard to get. At the same time, attachments to family and kin and place – the traditional pulls on rural peoples – led many young people to keep seeking any and all local employment to stay close to home – while many others did in fact look outside to work and to high schools to help them leave.

Constructivist Views on Schooling

Constructivist views on schooling dynamics attribute much more agency to students and teachers than competing psychological or sociological constructs (Woods, 1983; Atkinson, 1990). This theoretical view would also appear useful in linking the aforementioned historical explanations of attachment to place to a set of hypotheses or conjectures linking the way young people in different social contexts currently understand schools and teachers. The six Conjectures that began this essay are an attempt – using such a "social constructivist" perspective – to frame possible interpretations of classrooms and schools made within rural high schools today.

Positivist sociology and psychology in essence argue that the forces that influence or control human behavior need not be fully understood, only explainable and

predictable. Social or psychological facts or variables that might be related to observed outcomes need to be found and measured, then used to explain the behavior of individuals who may not even comprehend the meaning of their own actions (See Bredo and Feinberg, 1982). Under the designation of *socialization*, much work on teaching and learning behaviors has been studied as if previous learnings and reinforcement or sanctions explained current student or teaching endeavors. Inadequate teachers must have learned their behavior from poor role models or insufficient teacher education programs; low achieving students were distracted by peers, had no useful role models at home or in the community, or lacked intelligence.

Constructivist (or "interpretivist") models and theories argue instead that every teaching and learning encounter is a new experience and is partly independent from previous situations. The data for constructivist research must in essence come from those whose behavior is under study, for the cause of behavior is how those persons under study understand and negotiate their contexts. People are always "meaning makers" under this view, and not usually under the control of forces they do not or cannot understand. As an example here, "underachieving" students can only be a suitable category for a positivist researcher (or educational administrator) who has some external criteria of "achievement." The constructivist position is rather that most individuals are always trying to "achieve" something, but *they* are the ones who define achievement, since they are the ones trying to live a life under construction. The key for interpretivist or constructivist researchers is to understand how the research subjects define situations and *act*, rather than using external categories and variables to create the research problem.

For purposes of this essay, consider Peter Wood's explanation of how the school might be understood or interpreted by individuals in his introduction to the sociology of education. This citation can quite easily be fashioned to investigate how rural high school students of yesterday, and even today, interpret the school:

> At the heart of symbolic interactionism is the notion of people as constructors of their own actions and meanings. People live in a physical world, but the objects in that world have a "meaning" for them. They are not always the same objects for the same people, nor are situations interpreted in the same way. To some, school is a joyful and liberating arena, to others it may appear dull and restrictive, and be compared to prison or an army barracks. To the same person, a piece of chalk might be a writing implement on one occasion, a missile on another. In other words they are symbols – they indicate to a person certain meanings which are dependent on them for their construction (1983, p.1)

For most of American students, even rural students, the social transition of the US has partly involved their internalization that "school is a place to use for a good job and to move." I am arguing, however, that some rural students still do consider options for schooling that do not involve college and leaving home. They may not interpret schooling, particularly academic schooling, as important. They likely can distinguish the advocates of more academic math from those less committed to math for its own sake (e.g., vocational math teachers), and may thus avoid or deprecate the more "academic" math teachers. At the same time, many academic teachers, including math teachers,

adhere to the belief that their subject is very interesting, important for the future lives of all young people, and that those who do not agree and are not interested in their teachings (i.e., more "academic" versions of the curriculum) are academically deficient or strange ("the other"). The six conjectures focus upon these competing views: they make explicit the likelihood that students and teachers are "socially reconstructing" mathematics as they understand and negotiate it, and each other.

Of course the stakes remain high for everyone. Since more math is likely important for everyone's future, students may yet need to come to view it as such, if they do not already. At the same time, however, assuming that lack of interest in math is a character flaw of students, rather than an active appraisal of how they understand its utility (or meaning), leads to an elitism among teachers that can interfere with schools' success. In an era when schools are explicitly measured for their success, such assumptions will be curiously self-defeating.

Martin Trow (1961) actually predicted the importance of these matters almost forty years ago. He suggested that un-stratifying the high school was a major mission of public education policy for the future, at which we keep arriving. Put another way, we are at the point where reducing or eliminating the stratification of school knowledge is crucial if we are to continue to transform rural high schools into mass preparatory ones, assuming this is our proper goal. Recognizing that healthy rural communities may or may not benefit from our efforts seems actually another matter. I would argue for reconsidering the meaning and function of schooling at the community and organizational level. Even if curricular improvement is the only game in town, however, we still need to deal with Trow's concern:

Secondary education in the United States began as an elite preparatory system; during its great years of growth it became a mass terminal system; and it is now having to make a second painful transition on its way to becoming a mass preparatory system. But this transition is a good deal more difficult than the first, because while the first involved the creation of the necessary institutions, the second is requiring the transformation of a huge existing institutional complex. It is almost always easier to create new institutions to perform a new function than it is to transform existing institutions to meet new functions.

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